

CLAIMS

1. A fuel cell system that generates electric power when supplied with hydrogen and oxygen, comprising:

a fuel cell stack including a hydrogen electrode and an oxygen electrode that are disposed at opposite sides of an electrolyte;

a hydrogen supplier portion that supplies hydrogen to the hydrogen electrode;

an oxygen supplier portion that supplies oxygen to the oxygen electrode;

an input portion that inputs a requested electric power;

a generation control portion that causes the fuel cell stack to generate an electric power corresponding to the requested electric power by controlling the oxygen supplier portion and the hydrogen supplier portion; and

a non-generation-time control portion that stops a generation control performed by the generation control portion if the requested electric power is lower than or equal to a predetermined value, and that operates at least one of the oxygen supplier portion and the hydrogen supplier portion based on a predetermined condition regardless of the requested electric power.

2. The fuel cell system according to claim 1, wherein the non-generation-time control portion operates at least one of the oxygen supplier portion and the hydrogen supplier portion at a preset timing.

3. The fuel cell system according to claim 2, wherein the non-generation-time control portion operates the oxygen supplier portion at the preset timing.

4. The fuel cell system according to claim 1, further comprising a voltage measurement portion that measures a voltage between a positive electrode and a negative electrode of the fuel cell stack,

wherein the predetermined condition is that the voltage is lower than or equal to a predetermined value.

5. The fuel cell system according to claim 4, wherein the non-generation-time control portion operates the oxygen supplier portion if the voltage becomes equal to or less than the predetermined value.

6. The fuel cell system according to any one of claims 1 to 5, further comprising a hydrogen pressure detection portion that detects a pressure of hydrogen supplied to the hydrogen electrode,

wherein the non-generation-time control portion controls the oxygen supplier portion so as to supply oxygen to the oxygen electrode if the pressure of hydrogen decreases by a predetermined amount from a hydrogen pressure level occurring when a generation control performed by the generation control portion is stopped.

7. The fuel cell system according to claim 1, further comprising a hydrogen pressure detection portion that detects a pressure of hydrogen supplied to the hydrogen electrode,

wherein the predetermined condition is that the pressure of hydrogen is lower than or equal to a predetermined value.

8. The fuel cell system according to claim 7, wherein the non-generation-time control portion operates the hydrogen supplier portion if the pressure of hydrogen becomes equal to or less than the predetermined value.

9. The fuel cell system according to claim 7 or 8, wherein the non-generation-time control portion controls the oxygen supplier portion so as to supply oxygen to the oxygen electrode if the pressure of hydrogen decreases by a predetermined amount from a hydrogen pressure level occurring when a generation control performed by the generation control portion is stopped.

10. The fuel cell system according to claim 1, further comprising a power increase anticipation portion that anticipates an increase in the requested electric power,

wherein the predetermined condition is that the increase in the requested electric power is anticipated.

11. A mobile unit capable of moving by an electric motor that is driven by a fuel cell system as an energy source, wherein

the fuel cell system comprises: a fuel cell stack including a hydrogen electrode and an oxygen electrode that are disposed at opposite sides of an electrolyte; a hydrogen supplier

portion that supplies hydrogen to the hydrogen electrode; an oxygen supplier portion that supplies oxygen to the oxygen electrode; an input portion that inputs a requested electric power to drive the motor; and a generation control portion that causes the fuel cell stack to generate an electric power corresponding to the requested electric power by controlling the oxygen supplier portion and the hydrogen supplier portion, and

the mobile unit comprises: a power increase anticipation portion that anticipates an increase in the requested electric power; and a non-generation-time control portion that stops a generation control performed by the generation control portion if the requested electric power is lower than or equal to a predetermined value, and that operates at least one of the oxygen supplier portion and the hydrogen supplier portion regardless of the requested electric power if the increase is anticipated.

12. The mobile unit according to claim 11, wherein the power increase anticipation portion anticipates the increase based on at least one of an operation of an operating portion related to acceleration or deceleration of the mobile unit, a prediction related to a route of the mobile unit, and an acceleration that acts on the mobile unit in a direction transverse to a traveling direction of the mobile unit.

13. A control method for a fuel cell system that generates electric power when supplied with hydrogen and oxygen, wherein

the fuel cell system comprises: a fuel cell stack including a hydrogen electrode and an oxygen electrode that are disposed at opposite sides of an electrolyte; a hydrogen supplier portion that supplies hydrogen to the hydrogen electrode; and an oxygen supplier portion that supplies oxygen to the oxygen electrode, and

the control method comprises the steps of: inputting a requested electric power; causing the fuel cell stack to generate an electric power corresponding to the requested electric power by controlling the oxygen supplier portion and the hydrogen supplier portion; stopping electric power generation by the fuel cell stack if the requested electric power is lower than or equal to a predetermined value; and operating at least one of the oxygen supplier portion and the hydrogen supplier portion based on a predetermined condition regardless of the requested electric power after the electric power generation is stopped.